
Metabolism in Pluripotent Stem Cells and Early Mammalian Development.

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Public Summary:

Emerging and seminal studies have shown that cell metabolism influences gene expression by modifying the epigenome, which can regulate stem cell pluripotency, differentiation, and somatic cell reprogramming. Core pluripotency factors and developmental regulators reciprocally control the expression of key metabolism genes and their encoded pathways. Recent technological advances enabling sensitive detection methods during early mammalian development revealed the state-specific and context-dependent coordination of signal transduction, histone modifications, and gene expression in developing, resting, and malnourished embryos. Here, we discuss metabolism as a potential driver of earliest cell fate through its influence on the epigenome and gene expression in embryos and their in vitro surrogate pluripotent stem cells.

Scientific Abstract:

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